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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/934,548	08/23/2001	Ping Mei	10015160-1	9182

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HEWLETT-PACKARD COMPANY
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EXAMINER

WEISS, HOWARD

ART UNIT PAPER NUMBER

2814

DATE MAILED: 03/31/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/934,548	MEI ET AL.	
	Examiner	Art Unit	
	Howard Weiss	2814	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 December 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 7-9, 13-20, 26-29 and 31-41 ~~is/are~~ pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 7-9, 13-20, 26-29 and 31-41 ~~is/are~~ rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Attorney's Docket Number: 10015160-1

Filing Date: 8/23/01

Continuing Data: RCE established 6/16/03

Claimed Foreign Priority Date: none

Applicant(s): Mei et al. (Eaton, Jr.)

Examiner: Howard Weiss

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 7 to 9 and 32 to 35 are rejected under 35 U.S.C. 102(b) as being anticipated by DiMaria et al. (U.S. Patent No. 4,939,559).

DiMaria et al. show all aspects of the instant invention (e.g. Figure 1) including:

- a gate electrode **2** made of a diffusive metal (i.e. silver; Column 7 Lines 39 to 51)
- a floating gate **4** made of Al (ibid.)
- source **6**, drain **7** and channel regions all part of a continuous semiconductor material **8** and said source/drain regions are doped regions
- a gate insulator **5** extending between said floating gate and said channel
- diffused metal conductive paths (Column 4 Lines 39 to 43) and portions of the diffusive metal

In reference to the claim language referring to responsiveness of the diffusive metal path being formed by a write voltage and broken by a reversal of the write voltage, intended use and other types of functional language must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is

capable of performing the intended use, then it meets the claim. In a claim drawn to a process of making, the intended use must result in a manipulative difference as compared to the prior art. *In re Casey*, 152 USPQ 235 (CCPA 1967); *In re Otto*, 136 USPQ 458, 459 (CCPA 1963).

In reference to the claim language pertaining to the adoption to prevent conductive elements from the diffusive metal gate electrode, the claiming of a new use, new function, or unknown property which is inherently present in the prior art does not necessarily make the claim patentable. *In re Best*, 195 USPQ 430, 433 (CCPA 1977) and *In re Swinehart*, 439 F. 2d 210, 169 USPQ 226 (CCPA 1971); please see MPEP § 2112. Since DiMaria et al. show all the features of the claimed invention, the adaptation to prevent the conductive elements from the gate electrode is an inherent property of DiMaria et al.'s invention.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over DiMaria et al. and Kojima (U.S. Patent No. 5,644,528).

DiMaria et al. show most aspects of the instant invention (Paragraph 2) except for the floating gate being a plurality of floating gates. Kojima teaches (e.g. Figure 3) to use a plurality of floating gates 4_n to increase the memory capacity of the storage cell (Column 1 Lines 46 to 49). It would have been obvious to a person of ordinary skill in the art at the time of invention to use a plurality of floating gates as taught by Kojima in the device of DiMaria et al. to increase the memory capacity of the storage cell.

5. Claim 26 to 30 and 39 to 41 are rejected under 35 U.S.C. 103(a) as being unpatentable over DiMaria et al. and Simpson (U.S. Patent No. 6,362,504).

DiMaria et al. show most aspects of the instant invention (Paragraph 2) except for the use of low temperature oxide (LTO) for the gate oxide. Simpson teaches (e.g. Column 2 Lines 59 to 65) to use LTO in gate oxides to make thin gate oxides (Column 2 Lines 14 to 17). It would have been obvious to a person of ordinary skill in the art at the time of invention to use LTO in gate oxides as taught by Simpson in the device of DiMaria to make thin gate oxides.

6. Claim 31 is rejected under 35 U.S.C. 103(a) as being unpatentable over DiMaria et al. and Simpson, as applied to Claim 26, and further in view of Kojima.

DiMaria et al. and Simpson show most aspects of the instant invention (Paragraph 5) except for the floating gate being a plurality of floating gates. Kojima teaches (e.g. Figure 3) to use a plurality of floating gates 4_n to increase the memory capacity of the storage cell (Column 1 Lines 46 to 49). It would have been obvious to a person of ordinary skill in the art at the time of invention to use a plurality of floating gates as taught by Kojima in the device of DiMaria et al. to increase the memory capacity of the storage cell.

7. Claims 13 to 16, 20 and 36 to 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over DiMaria et al. and Noguchi (U.S. Patent No. 6,005,270).

DiMaria et al. show most aspects of the instant invention (Paragraph 2) except for the plurality of memory cells as claimed and the substrate made of glass or plastic. Noguchi teaches (e.g. Figure 10 and Column 16 Lines 17 to 44) to use a substrate **10** of glass or plastic and a plurality of gate **W_n** and data **B_n** with memory cells **MT_n** where said lines cross (Figure 3A) to carrier out batch erasing (Column 12 Lines 37 to 39). It would have been obvious to a person of ordinary skill in the art at the time of invention to use a substrate of glass or plastic and a plurality of gate and data with memory cells where said lines cross as taught by Noguchi in the device of DiMaria et al. to carrier out batch erasing.

8. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Noguchi and DiMaria et al., as applied to Claim 13 above, and further in view of Kojima.

Noguchi and DiMaria et al. show most aspects of the instant invention (Paragraph 7) except for the floating gate being a plurality of floating gates. Kojima teaches (e.g. Figure 3) to use a plurality of floating gates **4_n** to increase the memory capacity if the storage cell (Column 1 Lines 46 to 49). It would have been obvious to a person of ordinary skill in the art at the time of invention to use a plurality of floating gates as taught by Kojima in the device of Noguchi and DiMaria et al. to increase the memory capacity if the storage cell.

9. Claims 18 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Noguchi and DiMaria et al., as applied to Claim 13 above, and further in view of Ngo et al. (U.S. Patent No. 6,420,752).

Noguchi and DiMaria et al. show most aspects of the instant invention (Paragraph 7) except for the gate lines comprising first and second conductors. Ngo et al. teach (e.g. Figure 4A) to form a gate lines of two layers **218, 226** so as to form a "cap" or "passivation" layer to protect the gate line (Column 5 Lines 19 o 33). It would have been obvious to a person of ordinary skill in the art at the time of invention to form a gate lines of two layers as taught by Ngo et al. in the device of Noguchi and DiMaria et al. so as to form a "cap" or "passivation" layer to protect the gate line.

Response to Arguments

10. Applicant's arguments filed 12/17/03 have been fully considered but they are not persuasive. The arguments presented in the last office action (9/18/03) are still pertinent and considered repeated herein. In reference to the arrows in insulator area **5** of DiMaria et al., by definition, conductive paths are those paths that current carriers follow. In this case, it is electrons being injected form the gate electrode and into region **5** which define the diffused metal conductive paths. The shading in region **5** is the diffused metal (about 6%) which can be silver, a diffusive metal. In view of these reasons and those set forth in the present office action, the rejections of the stated claims stand.

Conclusion

11. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing

Art Unit: 2814

date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

12. Papers related to this application may be submitted directly to Art Unit 2814 by facsimile transmission. The faxing of such papers must conform with the notice published in the Official Gazette, 1096 OG 30 (15 November 1989). The Art Unit 2814 Fax Center number is **(703) 872-9306**. The Art Unit 2814 Fax Center is to be used only for papers related to Art Unit 2814 applications.

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Howard Weiss at **(571) 272-1720** and between the hours of 8:00 AM to 4:00 PM (Eastern Standard Time) Monday through Friday or by e-mail via **Howard.Weiss@uspto.gov**.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group 2800 Receptionist at **(703) 308-0956**.

14.9 The following list is the Examiner's field of search for the present Office Action:

Field of Search	Date
U.S. Class / Subclass(es): 257/ 315	thru 3/25/04
Other Documentation: none	
Electronic Database(s): EAST, IEL	thru 3/25/04

HW/hw
25 March 2004

Howard Weiss
Examiner
Art Unit 2814

LONG PHAM
PRIMARY EXAMINER